Notice No. 5

Rules and Regulations for the Classification of Naval Ships, January 2015

The status of this Rule set is amended as shown and is now to be read in conjunction with this and prior Notices. Any corrigenda included in the Notice are effective immediately.

Issue date: December 2015

Amendments to	Effective Date
Volume 3, Part 1, Chapter 2, Sections 1, 2 & 3	January 2016
Volume 3, Part 1, Chapter 3, Sections 1, 3, 4, 5 & 6	January 2016
Volume 3, Part 1, Chapter 4, Sections 1, 2, 3 & 4	January 2016
Volume 3, Part 3, Chapter 1, Section 4	January 2016
Volume 3, Part 3, Chapter 2, Section 7	January 2016

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Volume 3, Part 1, Chapter 2

Integrated Propulsion Systems

Effective date 1 January 2016

■ *Section 1*
General requirements

1.1 Application

1.1.3 The Rules contained in this Chapter cover machinery arrangements and control systems necessary for operating ~~essential~~ Mobility and/or Ship Type machinery from a (centralised) control station on the bridge under normal sea-going and manoeuvring conditions, but do not signify that the machinery space may be operated unattended.

1.2 Documentation required for design review

(*Part only shown*)
1.2.1 **Control systems**. Where control systems are applied to ~~essential~~ Mobility and/or, Ship Type machinery or equipment the following plans are to be submitted in triplicate:

(*Part only shown*)
1.2.2 Plans for the control systems of the following machinery are to be submitted:

- Main propelling machinery, including all auxiliaries ~~essential~~ for propulsion systems.
- Steam raising plant for ~~essential services~~ Mobility and/or Ship Type systems.

1.2.6 **Machinery configurations**. Plans showing the general arrangement of the machinery space, together with the layout and configuration of the main propulsion, ~~and essential machinery~~ and other machinery for Mobility and/or Ship Type systems, are to be submitted.

■ *Section 2*
Machinery arrangements

2.1 Main propulsion machinery

2.1.1 The main propulsion machinery may be oil engines, turbines or electric motors but the configuration of the propulsion system and its relationship with other ~~essential equipment~~ systems is to comply with the remaining requirements of this Section.

2.1.2 The main propulsion machinery is to drive one of the generators required by Vol 3, Pt 1, Ch 2, 2.2 Supply of electric power and essential services. This generator is to be capable of supplying the ~~essential~~ electrical load for Mobility and/or Ship Type systems under all normal sea-going and manoeuvring conditions.

2.2 Supply of electric power ~~and essential services~~ to Mobility and/or Ship Type systems

2.2.1 Continuity of electrical power supply ~~and essential services~~ for Mobility and/or Ship Type systems is to be ensured under all normal sea-going and manoeuvring conditions without manual intervention in the machinery space. Methods by which this may be achieved include automatic start-up of generating sets and ~~essential~~ pumps for Mobility and/or Ship Type systems or manual start-up of these ~~services~~ systems from the bridge.

■ *Section 3*
Control arrangements

3.2 Alarm system

3.2.1 An alarm system is to be provided to indicate faults in ~~essential~~ Mobility and/or Ship Type machinery and control systems in accordance with this Chapter.

3.6 Automatic control of ~~essential services~~ Mobility and/or Ship Type systems

3.6.1 All control systems for ~~essential services~~ Mobility and/or Ship Type systems are to be stable throughout the operating range of the main propulsion machinery.

3.6.5 Boilers ~~essential for~~ required for the operation of the propulsion of the vessel are to be provided with an automatic combustion control system.

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3.7 Local control

3.7.1 The arrangements are to be such that ~~essential~~ Mobility and/or Ship Type machinery can be operated with the system of bridge control or any automatic controls out of action. Alternatively, the control systems should have sufficient redundancy so that failure of the control equipment in use does not render ~~essential~~ Mobility and/or Ship Type machinery inoperative.

Volume 3, Part 1, Chapter 3

Propulsion and Steering Machinery Redundancy

Effective date 1 January 2016

■ *Section 1*
General requirements

1.2 Documentation required for design review

1.2.3 **Risk Assessment (RA)**. For the propulsion systems, electrical power supplies, ~~essential services,~~ control systems ~~and~~, steering arrangements, and other Mobility and/or Ship Type systems; a RA report is to be submitted and is to address the requirements identified in Vol 3, Pt 1, Ch 3, 2 Risk Assessment (RA) and Vol 3, Pt 1, Ch 3, 5 Separate machinery spaces * (star) Enhancement.

■ *Section 3*
Machinery arrangements

3.3 Electrical power supply

3.3.1 The main busbars of the switchboard supplying the propulsion machinery and ~~essential services~~ other Mobility and/or Ship Type systems are to be capable of being isolated by a multi-pole linked circuit breaker, disconnector, or switch-disconnector into at least two independent sections.

3.3.2 In the event of the loss of one section or failure of the power supply from one generator, there is to be continuity of sufficient electrical power to supply ~~essential services~~ Mobility and/or Ship Type systems such that the available installed prime mover capacity and installed propulsion systems will continue to have the ability of functioning at their operational capability where **PSMRL**, **PSMRL★**, **PMRL** and **PMRL★** notations are required. *See* Vol 3, Pt 1, Ch 3, 3.2 Steering machinery for steering machinery requirements.

3.3.3 In the event of the loss of one section or failure of the power supply from one generator, there is to be continuity of sufficient electrical power to supply ~~essential services~~ Mobility and/or Ship Type systems such that at least 50 per cent of the installed prime mover capacity and not less than 50 per cent of the installed propulsion systems will continue to be available where **PSMR**, **PSMR★**, **PMR** and **PMR★** notations are required. *See* Vol 3, Pt 1, Ch 3, 3.2 Steering machinery for steering machinery requirements.

3.3.4 For ships capable of operating with one service generator connected to the switchboard, arrangements are to be such that a standby generator will automatically start and connect to the switchboard on loss of the service generator. Sequential starting of ~~essential services~~ Mobility and/or Ship Type systems is to be provided.

3.3.5 For ships operating with two or more generator sets in service connected to the switchboard, arrangements are to be such that, in the event of loss of one generator, the remaining set(s) is to be adequate for the continuity of ~~essential services~~ Mobility and/or Ship Type systems supplied from that switchboard. This may be achieved by preferential tripping of ~~non-essential~~ services not required for the Mobility and/or Ship Type. Alternatively, arrangements can be such that a standby generator will start automatically and connect to the switchboard on loss of one of the generator sets in service.

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■ *Section 4*
Control arrangements

4.2 Bridge control

4.2.4 Where required by Vol 3, Pt 1, Ch 3, 5.4 Essential services for machinery, isolation of ~~essential services~~ Mobility and/or Ship Type systems is to be carried out either automatically or manually from the bridge. Indication of the status of isolation arrangements is to be provided on the machinery console.

4.2.5 A means of indicating the operational status of running and standby machinery is to be provided for the propulsion systems, the supply of electrical power, steering systems and other ~~essential services~~ Mobility and/or Ship Type systems.

■ *Section 5*
Separate machinery spaces * (star) Enhancement

5.3 Electrical power supply

5.3.3 In the event of the loss of one compartment, there is to be continuity of sufficient electrical power to supply ~~essential services~~ Mobility and/or Ship Type systems, such that propulsion power and steering capability will continue to be available.

5.4 ~~Essential services~~ Mobility and Ship Type systems for machinery

5.4.3 Where ~~essential services~~ Mobility or Ship Type systems are arranged so that they may supply machinery in another compartment, means of isolation from that compartment is to be provided.

5.4.4 Where pumps for ~~essential services~~ Mobility or Ship Type systems are arranged to supply more than one compartment, standby pumps for the same supplies are to be provided in a different compartment. The standby pumps are to be arranged to start automatically if the discharge pressure from the working pumps falls below a predetermined value.

5.8 Risk Assessment (RA)

5.8.1 The RA required by Vol 3, Pt 1, Ch 3, 2.1 General for the propulsion systems, electrical power supplies, ~~essential services,~~ control systems ~~and~~, steering arrangements and other Mobility and/or Ship Type systems is also to address the following:
(a) Fire in a machinery space or control room.
(b) Flooding of any watertight compartment which could affect propulsion or steering capability.
(c) Separation of machinery spaces.

■ *Section 6*
Testing and trials

6.1 Sea trials

6.1.3 Where the Risk Assessment report has identified the need to prove the conclusions, testing and trials are to be carried out as necessary to investigate the following:
(a) The effect of a specific component failure.
(b) The effectiveness of automatic/manual isolation systems.
(c) The behaviour of any interlocks that may inhibit operation of ~~essential~~ Mobility or Ship Type systems.

Volume 3, Part 1, Chapter 4

Manoeuvring Assessment

Effective date 1 January 2016

■ *Section 1*
General

1.1 Application

1.1.7 Where the **LNMA** notation is applied, these Rules enable LR to verify compliance with the minimum manoeuvring performance criteria defined in STANAG 4721 *Common Framework for Naval Surface Ship Manoeuvring Performance and Requirements*.

1.3 Information and Documentation required for design review

1.3.1 ~~Information, as specified in Vol 3, Pt 1, Ch 4, 1.3 Information and Documentation required for design review, is to be submitted for the ship in the condition to be used during verification trials.~~ Information required for **LNMA** assessment:

- Mission type justification report, *see* Vol 3, Pt 1, Ch 4, 3.2.1;
- Ship specific manoeuvring performance criteria, *see* Vol 3, Pt 1, Ch 4, 3.2.3;
- Simulation report;
- Model test report.

(*Part only shown*)
1.3.2 Information required for **LMA** assessment:

1.4 Sister ships

1.4.1 In so far as these Rules are concerned, a ship will be deemed a sister ship, if that ship has been built to the same plans as the lead ship which has completed a manoeuvring assessment in accordance with ~~those requirements specified in Vol 3, Pt 1, Ch 4, 1.1 Application or Vol 3, Pt 1, Ch 4, 1.1 Application~~ the requirements of this Chapter.

1.4.5 For a sister ship to a ship carrying the **LNMA** notation the ship will be required to verify performance at sea trials. ~~The manoeuvres to be conducted are to be agreed between LR, the Owner and the Naval Administration in the sea trial procedures.~~ The manoeuvring performance criteria to be achieved are to be the same as those applied for the lead ship. The manoeuvres which are required to be repeated for a sister ship are shown in Table 4.1.1 Required submissions according to design phase.

Table 4.1.1: Required submissions according to design phase

Performance test	Detailed design	Acceptance trials
Zig-zag	S, M	T
Turning	S, M	T, T2
Accelerating turning	M	T
Turning at rest		T
Course keeping	S, M	T
Astern course keeping	M	T
Track keeping	S, M	T
Station keeping	S, M	T
Stopping test	S	T, T2
Acceleration/deceleration	S	T
SDNE		T, T2
Pull out, spiral test	S, M	T
Note S = Simulation, M = Model tests, T = Trials of first ship, T2 = Trials of sister ships		

■ *Section 2*

Assessment for LMA notation

2.1 General

2.1.2 The calculations ~~will normally be carried out by LR, but may be carried out~~ are to be undertaken by the designer or Shipbuilder and submitted to Lloyd's Register (hereinafter referred to as 'LR') for ~~assessment together with the data specified in Vol 3, Pt 1, Ch 4, 1.3 Information and Documentation required for design review~~ review.

■ *Section 3*

Assessment for LNMA notation

3.1 General

3.1.1 ~~For the assignment of the **LNMA** notation, model tests are to be carried out and supported by calculations, using the information specified in Vol 3, Pt 1, Ch 4, 1.3 Information and Documentation required for design review , to predict the ship's manoeuvring capability which must satisfy the requirements of Vol 3, Pt 1, Ch 4, 3.2 Manoeuvring performance criteria. The predicted performance against the requirements of Vol 3, Pt 1, Ch 4, 3.2 Manoeuvring performance criteria will be verified during sea trials.~~ For assignment of the LNMA notation a ships manoeuvring performance shall be verified at the design stage through simulation and model tests, and validated during sea trials.

3.1.2 ~~The calculations will normally be carried out by LR, but may be carried out by the designer or Shipbuilder and submitted to LR for assessment together with the data specified in Vol 3, Pt 1, Ch 4, 1.3 Information and Documentation required for design review.~~ Detailed computations or simulation are to be undertaken in accordance with STANAG 4721, Section 5.2.1.2 and results are to be submitted to LR for review for the manoeuvring abilities defined in Table 4.1.1 Required submissions according to design phase.

3.1.3 The model tests are to be carried out by a recognised ~~organisation~~ facility that is acceptable to LR and a report is to be submitted ~~to LR~~ detailing the test arrangements, schedule of tests and results presented in both diagrammatic and tabular form. The model testing is to be undertaken in accordance with STANAG 4721, Section 5.2.2 and results are to be provided for the manoeuvring abilities defined in Table 4.1.1 Required submissions according to design phase.

3.1.4 Final verification of the assignment of the **LNMA** notation will be dependent on the results of sea trials, *see* Vol 3, Pt 1, Ch 4, 4 Verification trials.

3.2 Manoeuvring performance criteria

Existing paragraphs 3.2.1 *to* 3.2.9 *have been deleted.*

Existing Table 4.3.1 *has been deleted*.

3.2.1 STANAG 4721 provides manoeuvring performance criteria in relation to NATO defined missions. Descriptions of these missions are given in STANAG 4721, Section 3.1. The NATO mission types which will be used to determine the ship’s manoeuvring performance criteria are to be agreed between the Owner and the designer. For this purpose the designer is to develop a justification report which outlines how the missions selected are consistent with the CONOPS. The report format is to follow the Goal, Safety functional objectives and Mission Effectiveness functional objectives defined in STANAG 4721, Section 4.1 and 4.2 respectively. The justification report is to be approved by the Owner.

3.2.2 The Safety manoeuvring performance criteria are to be determined from STANAG 4721, Tables 4.1 to 4.3 and are to be achieved by all ships for which the notation is requested to be assigned.

3.2.3 The Mission Effectiveness manoeuvring performance criteria are to be determined from STANAG 4721, Tables 4.6 to 4.20 for the NATO missions determined for a specific ship in accordance with Vol 3, Pt 1, Ch 4, 3.2.1. The ‘required level’ performance criteria as opposed to the ‘target’ performance criteria are to be achieved by that ship. The manoeuvring performance criteria are to be calculated for each mission type and manoeuvring ability using the required verification speed. These manoeuvring performance criteria, once calculated, are to be documented in a ship specific report for ease of reference.

3.2.4 The measures by which these criteria are to be assessed are provided in STANAG 4721, Table 3.12.

3.3 Wheelhouse poster and manoeuvring booklet

3.3.1 ~~The results of the calculations or model tests required by Vol 3, Pt 1, Ch 4, 3.1 General (stating the assumptions made), together with additional information gained from the verification trials, and trial data for the man overboard manoeuvre, are to be presented in diagrammatic and tabular form and included in a wheelhouse poster and a manoeuvring booklet.~~ Following sea trials, further trials on an opportunity basis will be required to provide the ship with NATO/Partner for Peace (PfP) Wheelhouse poster and Pilot Card as specified in ANEP–79 as well as recommended operator guidance such as the Manoeuvring Handbook, *see* e.g. ANEP-70 Vol. II.

~~3.3.2 The poster is to be permanently displayed in the wheelhouse, and is to contain a clear warning that the data presented is applicable to calm weather with no wind, waves or current. The booklet is to be placed on board and is to contain comprehensive details of the ship’s manoeuvring characteristics.~~

~~3.3.3 The format, data and content of the wheelhouse poster and the manoeuvring booklet are to meet the requirements of the specified standards.~~

Existing sub-Section 3.4 *has been deleted.*

Volume 3, Part 1, Chapter 4

■ *Section 4*
Verification trials

4.1 General

4.1.1 For the assignment of the **LMA** or **LNMA** notation, representative manoeuvres are to be carried out during sea trials, in accordance with the guidelines in Vol 3, Pt 1, Ch 4, 5 Guidelines on conducting ship verification trials, to verify ~~estimates derived in~~ that the manoeuvring performance criteria defined in Vol 3, Pt 1, Ch 4, 2 Assessment for LMA notation or Vol 3, Pt 1, Ch 4, 3 Assessment for LNMA notation as applicable are achieved in practice.

4.4 Approach conditions

4.4.2 The approach speed for the assessment under Vol 3, Pt 1, Ch 4, 3 Assessment for LNMA notation (**LNMA** notation) is to be ~~at least 100 per cent of the ship's speed unless otherwise specified~~ the required verification speed for that mission type.

Volume 3, Part 3, Chapter 1

General Requirements

Effective date 1 January 2016

■ *Section 4*
Integration for EER notation

4.2 System integration

4.2.4 Where the integration involves control and safety functions for ~~essential services~~ Mobility or Ship Type systems ~~or safety functions~~, a robust system Risk Assessment in accordance with Vol 2, Pt 1, Ch 3, 17 Risk Assessment (RA) is to be used. The Risk Assessment is to demonstrate that the integrated system will not render ~~essential services~~ the control and safety functions of Mobility or Ship Type systems inoperable as a result of single item failure or cause failure of Mobility or Ship Type systems.

Volume 3, Part 3, Chapter 2

Fire Protection

Effective date 1 January 2016

■ *Section 7*
Fire extinguishing

7.1 Fire extinguishing objective

(*Part only shown*)
7.1.2 **Fire Extinguishing Goal 1**. Arrangements on board are to be such that all detected fires can be extinguished using a medium which is suitable for the nature of the fire.

(h) With regard to sprinkler systems, NS1 and NS2 ships, and those designed to carry in excess of 50 embarked personnel, are to be fitted with an automatic sprinkler, fire detection and fire alarm system in accordance with the FSS Code or other agreed specified standard in all control stations, accommodation and service spaces. Alternatively, if a water sprinkler system may cause damage to ~~essential~~ Mobility and/or Ship Type equipment, an agreed alternative fixed fire-fighting system is to be specified. Spaces where there is little or no risk of fire need not be fitted with such a system.

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